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(54) A process for covering particle board

(57) The process comprises impregnation of first sheets of paper with a first aqueous resin having a solids content of 30-60 % of urea-melamine-formaldehyde resin; from 4-10 % of a plasticizer; a surfactant wetting agent; a catalyst, and a mould stripping agent; impregnation of second sheets of paper with a second aqueous resin having a solids content of from 30-60 % of urea-melamine-formaldehyde resin; 0-8 % of a plasticizer; a surfactant wetting agent; a catalyst and a mould stripping agent, this impregnation until the sheets have a resin solids content of 30-60 % and a volatiles content of 5-7 %; forming an ensemble with a first sheet of paper, a second sheet of paper, a board, a second sheet of paper and a first sheet of paper; and pressing the ensemble, the press surface being at a temperature ranging from 130 to 180 °C

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Description

The invention relates to a process for covering particle board, particularly board having a thickness of from 10 to 40 mm, and having two main opposite surface layers of a surface density in excess of 800 kg/cu.m. and a face strength ranging from 8 to 12 kg/sq.cm, said covering comprising, for each surface, a first sheet of paper in contact with the layer and a second sheet of paper applied over said first sheet, said process comprising a pressing step. The "face strength" is determined according to the European Norm 311, entitled "Surface soundness".

In other words, the invention concerns a covering of particle board with paper impregnated with a modified aminoplastic resin; the covering is produced in a short cycle medium pressure pressing line.

The invention seeks to provide a process in which the covered board is suitable to be subjected to a post-forming process in which the covering paper may be curved, with an appropriate device, over the edge of the board, with a minimum radius of curvature of 4 mm and without cracks being formed in the covered board surface.

This aim is achieved with a process of the type referred to at the beginning which is characterized in that it comprises the following steps: (A) providing first sheets of paper weighing between 60 and 180 g/sq.m.; (B) providing a first aqueous resin with a solids content of 30 to 60 wt% of urea-melamine-formaldehyde resin of low degree of condensation; from 4 to 10 wt% of a plasticizer from the family of the sulphonamides or the polyglycols; from 0.3 to 1 wt% of a wetting agent of the group formed by surfactants; from 0.5 to 3 wt% of an acid catalyst; and from 0.5 to 1 wt% of a mould stripping agent; (C) impregnating said first sheets with said aqueous resin, until said first sheets have a resin solids content of 45 to 60 wt% and a volatiles content of 5 to 7 wt%; (D) providing second sheets of paper; (E) providing a second aqueous resin having a solids content of from 30 to 60 wt% of urea-melamine-formaldehyde resin of low degree of condensation, from 0 to 8 wt% of a plasticizer from the family of the sulphonamides or the polyglycols; from 0.1 to 1 wt% of a wetting agent of the family of the surfactants; from 0.2 to 2 wt% of an acid catalyst; and from 0.1 to 1 wt% of a mould stripping agent; (F) impregnating said second sheets with said second aqueous resin, until said second sheets have a resin solids content of 30 to 60 wt% and a volatiles content of 5 to 7 wt%; (G) forming an ensemble comprising successively a first sheet of paper, a second sheet of paper, a board, a second sheet of paper and a first sheet of paper; and (H) pressing said ensemble, applying a specific pressure ranging from 20 to 30 kg/sq.cm, the press surface being in contact with the ensemble at a temperature ranging from 130 to 180 °C, for a period of time ranging from 30 to 80 seconds.

Said plasticizer is preferably o-p-toluene sulphonamide or diethylene glycol; said wetting agent is an alkyl nonyl phenol; said acid catalyst is an acid hydrolysis organic acid salt and said mould stripping agent is an aqueous silicone emulsion.

The invention provides advantages over the present techniques of post-formable board coverings.

One advantage lies in directly obtaining, in a single operation, a post-formable product by application of impregnated paper to the board in a short cycle, medium pressure press, instead of having to manufacture first an impregnated paper covering in a long cycle high pressure press and then adhere said covering to a base board in another press.

Another advantage obtained from the invention is that a post-formable product is obtained by a paper covering having a much lower overall weight than that used in the long cycle high pressure coverings and with the use of aminoplastic resins instead of phenolic resins.

As stated above, the product of the present invention is obtained by covering a particle board of appropriate surface properties, specifically the density of its surface layer, and the face strength.

The covering must comprise four sheets of impregnated paper per board, two on each side, with the sheets which are applied directly on the board surfaces being different from the outer ones applied over the former.

The sheets of paper applied directly to the board must weigh from 60 to 180 grams per square metre and must be impregnated with a urea-melamine-formaldehyde resin of low degree of condensation, but having a long shelf life, modified with plasticizers from the families of the polyglycols and the sulphonamides.

The outer sheets of paper applied over the previous ones, are the usual decorative papers in all kinds of high and low pressure, long and short cycle coverings, but for this application they must be impregnated with a urea-melamine-formaldehyde resin of low degree of condensation, but having a long shelf life, modified with plasticizers from the families of the polyglycols and of the sulphonamides.

The postformable covering of the present invention is produced in a short cycle, medium pressure press by application of an appropriate pressure and temperature to the ensemble formed by a particle board between four impregnated papers as described above, two on one side and the other two on the other side, the papers in contact with the board being different from the outer papers.

Hereinafter, without any limitative effect, there are described examples of the process of the invention.

EXAMPLE 1

A wood particle board, having a surface layer density of 910 kg per cu.m. and a face strength of 12 kg/sq. cm., is placed between four impregnated papers, two on each side, of the following properties:

Papers in contact with the lower and upper surfaces

of the board: paper of 132 g/sq.m. impregnated with resin such that the resin solids content of the impregnated paper is 58 wt% and the volatiles content is 7%. For impregnation, an aqueous resin having a solids content of 42% of urea-melamine-formaldehyde resin of low degree of condensation, with 9.5% of ortho-para-toluene sulphonamide as plasticizer, 0.9% of octyl nonyl phenol as wetting agent and 2.2% of para-toluene sulphonic acid ammonium salt was used.

External decorated papers: paper of 72 g/sq.m. impregnated with resin such that the resin solids content of the impregnated paper is 58 wt% and the volatiles content is 7%. For impregnation, an aqueous resin having a solids content of 48% of urea-melamine-formaldehyde resin of low degree of condensation, with 0.9% of octyl nonyl phenol as wetting agent, 1.5% of para-toluene sulphonic acid ammonium salt and 0.6% of M-75 mould stripping agent was used.

The ensemble formed by the board and the four papers is subjected to a pressing operation in a medium pressure, short cycle installation, applying a specific pressure of 25 kg/sq.m and a temperature of the press surface in contact with the ensemble of 140°C, for a period of 60 seconds.

EXAMPLE 2

A wood particle board, having a surface layer density of 820 kg per cu.m. and a face strength of 10 kg/sq. cm., is placed between four impregnated papers, two on each side, of the following properties:

Papers in contact with the lower and upper surfaces of the board: paper of 160 g/sq.m. impregnated with resin such that the resin solids content of the impregnated paper is 50 wt% and the volatiles content is 6%. For impregnation, an aqueous resin having a solids content of 35% of melamine-formaldehyde resin of low degree of condensation, with 6.0% of diethylene glycol as plasticizer, 2.2% of octyl nonyl phenol as wetting agent and 1.2% of para-toluene sulphonic acid ammonium salt was used.

External decorated papers: paper of 120 g/sq.m. impregnated with resin such that the resin solids content of the impregnated paper is 51 wt% and the volatiles content is 6%. For impregnation, an aqueous resin having a solids content of 40% of melamine-formaldehyde resin of low degree of condensation, with 2.0% of octyl nonyl phenol as wetting agent, 1.0% of para-toluene sulphonic acid ammonium salt and 1.5% of M-75 mould stripping agent was used.

The ensemble formed by the board and the four papers is subjected to a pressing operation in a medium pressure, short cycle installation applying a specific pressure of 25 kg/sq.m and a temperature of the press surface in contact with the ensemble of 145°C, for a period of 70 seconds.

Claims

1. A process for covering particle board, particularly board having a thickness of from 10 to 40 mm, and having two main opposite surface layers of a surface density in excess of 800 kg/cu.m. and a face strength ranging from 8 to 12 kg/sq.cm, said covering comprising, for each surface, a first sheet of paper in contact with the layer and a second sheet of paper applied over said first sheet, said process comprising a pressing step, characterized in that it comprises the following steps: (A) providing first sheets of paper weighing between 60 and 180 g/sq. m.; (B) providing a first aqueous resin with a solids content of 30 to 60 wt% of urea-melamine-formaldehyde resin of low degree of condensation; from 4 to 10 wt% of a plasticizer from the family of the sulphonamides or the polyglycols; from 0.3 to 1 wt% of a wetting agent of the family of the surfactants; from 0.5 to 3 wt% of an acid catalyst; and from 0.5 to 1 wt% of a mould stripping agent; (C) impregnating said first sheets with said aqueous resin, until said first sheets have a resin solids content of 45 to 60 wt% and a volatiles content of 5 to 7 wt%; (D) providing second sheets of paper; (E) providing a second aqueous resin having a solids content of from 30 to 60 wt% of urea-melamine-formaldehyde resin of low degree of condensation, from 0 to 8 wt% of a plasticizer from the family of the sulphonamides or the polyglycols; from 0.1 to 1 wt% of a wetting agent of the family of the surfactants; from 0.2 to 2 wt% of an acid catalyst; and from 0.1 to 1 wt% of a mould stripping agent; (F) impregnating said second sheets with said second aqueous resin, until said second sheets have a resin solids content of 30 to 60 wt% and a volatiles content of 5 to 7 wt%; (G) forming an ensemble comprising successively a first sheet of paper, a second sheet of paper, a board, a second sheet of paper and a first sheet of paper; and (H) pressing said ensemble, applying a specific pressure ranging from 20 to 30 kg/sq.cm, the press surface being in contact with the ensemble at a temperature ranging from 130 to 180 °C, for a period of time ranging from 30 to 80 seconds.

2. The process of claim 1, characterized in that said second sheets have a weight ranging from 60 to 180 g/sq.m.

3. The process of claim 1 or claim 2, characterized in that said plasticizer is o-p-toluene sulphonamide or diethylene glycol.

4. The process of any one of claims 1 to 3, characterized in that said wetting agent is an alkyl nonyl phenol.

5. The process of any one of claims 1 to 4, character-

ized in that said acid catalyst is an acid hydrolysis organic acid salt.

6. The process of any one of claims 1 to 5, characterized in that said mould stripping agent is an aqueous silicone emulsion.